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EDITORIAL COMMENT

Lumen *et al.* present a retrospective 2-year series of 7 patients with penile insufficiency who were reconstructed using free microvascular tissue phalloplasty. All patients had loss of functional penile tissue from surgery for bladder exstrophy or hypospadias, repeat placement of penile prosthesis, or amputation from trauma or cancer. Four of the patients underwent reconstruction for a congenital anomaly. Six of the patients were reconstructed with a radial forearm free flap and 1 with an anterolateral thigh flap. Flap survival was 100%. All 7 patients had low self-esteem, which improved after penile reconstruction. Cosmetic results were excellent. The authors should be commended for their work with complex penile reconstruction in this challenging group of patients.

Microvascular phalloplasty has become the gold standard for total penile reconstruction. Having first described the use of the radial forearm free flap for penile reconstruction in 1984, Chang *et al.*[1] paved the way for more complex and sophisticated reconstruction. Modifications such as the coronal flap and full-thickness skin graft to imitate the glans of the penis and tattooing of the glans[2] have further refined the technique and improved the aesthetic results. The experience with sex reassignment surgery in female-to male-transsexual patients has demonstrated that meticulous nerve dissection and nerve coaptation of the ilioinguinal and dorsal nerves with the cutaneous nerves to the flap allows the reconstructed penis to obtain tactile and erogenous sensitivity.[3] Incorporating remnant glandular tissue into the base of the reconstructed penis in congenital cases may provide similar results.

Although the aesthetic results of microsurgical phalloplasty have become quite satisfactory, the urethroplasty complication rate and dissatisfaction with the forearm donor site remains high. The authors report a urethral fistula complication rate of 40%, which is comparable to that seen in other series.[2] Most of the urethral problems can be corrected with secondary procedures. Use of the anterolateral thigh flap for microsurgical phalloplasty avoids many of the concerns about the forearm donor site. Despite these complications, patient satisfaction remains high after reconstruction.

Our team of plastic surgeons and urologists has had similar results using the radial forearm flap for penile reconstruction in patients with severe penile insufficiency secondary to bladder exstrophy. We have also used a small, tubed radial forearm free flap for urethral reconstruction alone in patients with inadequate soft tissue after multiple failed attempts at hypospadias correction.

In their small series of patients, the authors have demonstrated that improved aesthetics and return of sexual function after innervated microvascular free tissue phalloplasty make this technique a viable option for penile reconstruction in patients with penile insufficiency. Their excellent results with congenital cases are encouraging.

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Richard Redett, M.D., Director, Pediatric Plastic Surgery
Division of Plastic and Reconstructive Surgery
The Johns Hopkins Medical Institutions
Baltimore, Maryland

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EDITORIAL COMMENTS

This is an informative and timely report on salvage surgery for penile insufficiency. In this reviewer's practice most of these patients are some variant of the exstrophy-epispadias complex, notably cloacal exstrophy and classic exstrophy in males. Formerly, many male patients with cloacal exstrophy were raised as female, but gender reassignment in these patients is not currently performed in North America. The second group are male exstrophy patients who were born with severe insufficiency (more than the average exstrophy patient) or those who have had severe complications associated with some of the more recent exstrophy repairs.[1,2]

Phalloplasty has become a viable option with improvements in microsurgical and psychological evaluations. In this reviewer's limited experience with two of these procedures, both patients were quite happy with the result after sustaining both corporal and glandular loss with the penile disassembly-type repair. In our large exstrophy population we see numerous adolescents yearly who request an increase in penile size, and most of these can be helped with standard reconstructive techniques. However, a "hard core" group remains, with damage either to the corpora or glans or such an inadequate size that surgery of this magnitude is required for an acceptable lifestyle. The authors show that it can be safe, successful, and reproducible in the exstrophy group. Until tissue engineering technology becomes more advanced, phalloplasty as advanced by the authors is an important part of our reconstructive armamentarium.

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John P. Gearhart, M.D., Brady Urological Institute
Division of Pediatric Urology
The Johns Hopkins Hospital
Baltimore, Maryland

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AUTHOR RESPONSE

Lumen Nicolaas, M.D. Department of Urology
Ghent University Hospital
Ghent, Belgium

Phalloplasty for severe penile insufficiency is indeed a possible treatment for the complex group of patients having had several reconstructive surgeries for hypospadias, epispadias, bladder exstrophy, and cloacal exstrophy. Because of the possible complications of phalloplasty (urethral stenosis, fistula, and infection of penile stiffener) this treatment should only be reserved for patients in whom standard reconstructive techniques will be insufficient for adequate penile size and function. In case of a changed pelvic and inguinal anatomy, which is frequently the case after surgery for bladder or cloacal exstrophy, we highly recommend the anterolateral thigh flap to avoid microsurgical problems. If the patient wishes to avoid a visible scar at the forearm, the anterolateral thigh flap is a valuable option.

We encourage centers that frequently treat this difficult group of patients to send these patients for phalloplasty when indicated. Of course, because phalloplasty is rarely performed, this type of surgery should only be performed in centers in which the reconstructive urologist and the plastic surgeon are familiar with microsurgical phalloplasty. Because only small series have been reported, we encourage everyone performing phalloplasty for this condition to follow their patients and publish their results, to improve the reconstructive techniques for this group of patients.

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